Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

CALCULUS.

306. **Proposed by FRANCIS RUST, C. E., Pittsburg, Pa.**

Express in elliptic integrals: $A_\theta=\int_0^\theta \frac{dx}{\sqrt{(1-x^4)}}$; $0<\theta<0$.

307. **Proposed by S. G. BARTON, Ph. D., Clarkson School of Technology.**

The maximum value is not necessarily the greatest value of a function. Show why we take the maximum value as the greatest value in practical problems in maxima and minima. Likewise minimum for least value.

MECHANICS.

259. **Proposed by J. SCHEFFER, A. M., Hagerstown, Md.**

A uniform beam of the weight W, rests on a horizontal plane, and leans against a vertical wall, but so as *not* to lie in a vertical plane. Denoting the pressure upon the horizontal and vertical planes, respectively, by x and y, the coefficients of friction respectively, by μ and μ'; the angle which the perpendiculars from the foot of the beam upon the intersection of both planes makes with the beam by ϕ; the angle which this perpendicular makes with the direction of the friction peg by ξ; and the angle, which the projection of the beam upon the vertical wall makes with the vertical line, by ψ. To prove: $(1+\mu^2)\mu'^2\sin^4\psi-[1+\mu'^2+4\mu^2\mu'^2]\sin^2\psi+4\mu^2\mu'^2=0$; $\tan\xi=\mu'\cos\psi$, $\tan\phi=\mu'\cot\psi$, $x=\frac{\mu\cos\xi}{1+\mu\mu'\sin\psi\cos\xi}W$, $y=\frac{1}{1+\mu\mu'\sin\psi\cos\xi}W$.

NUMBER THEORY AND DIOPHANTINE ANALYSIS.

181. **Proposed by V. M. SPURAR, M. and E. E., Chicago, Ill.**

If $2n+1$ is an odd prime p, $(2n)!\equiv(-1)^n 2^{4n}(n!)^2 \pmod{p^2}$.

182. **Proposed by V. M. SPUNAR, M. and E. E., Chicago, Ill.**

Find two general solutions in integers of the equation $x^2=616318177y-1$.

148. **Proposed by R. D. CARMICHAEL, Anniston, Ala.**

Find all the multiply perfect numbers of n different prime factors and of multiplicity $n-1$.

153. **Proposed by LLOYD HOLSINGER, A. B., 227 Fredonia Avenue, Peoria, Ill.**

If we represent by (k, l) the greatest common divisor of k and l, and by $\phi(k)$ the number of integers prime to k and not greater than k, we have

$$\begin{vmatrix} (1,1) & (1,2) & (1,3) & \dots & (1,n) \\ (2,1) & (2,2) & (2,3) & \dots & (2,n) \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ (n,1) & (n,2) & (n,3) & \dots & (n,n) \end{vmatrix} = \phi(1).\phi(2).\phi(3)\dots.\phi(n).$$

157. **Proposed by A. H. HOLMES, Brunswick, Maine.**

Find integral values for m and n in $64m^2n^2(m^2-n^2)^2+(m^2+n^2)^4=\square$.

161. Proposed by R. D. CARMICHAEL, Anniston, Ala.

Find a solution of $x^4-5x^2+4\equiv 0$ (mod $p.\overline{2p+1}$), where both p and $2p+1$ are odd primes.

162. Proposed by L. E. DICKSON, Ph. D., Associate Professor of Mathematics, The University of Chicago.

If p is an odd prime, find the number of incongruent integers x for which x^4+2ex^2+f is a quadratic residue of p.

166. Proposed by H. S. VANDIVER, Bala, Pa.

Eliminate any five of the seven quantities h, j, k, l, m, r, s, from:

$$\begin{aligned}
j+m+r&=k+l+s,\\
h&=3(r+s)-(n+1),\\
j+m+2r+s&=n,\\
hr+j^2+km+ms&=jk+mr+s^2+rs,\\
ks+jl+rs+r&=sh+jk+l^2+rk,\\
hr+jl+ks+ls+km&=jm+mr+2rs+rj.
\end{aligned}$$

167. Proposed by R. D. CARMICHAEL, Anniston, Ala.

Prove that $\Pi\dfrac{p+(-1)^{\frac{1}{2}(p+1)}}{p-(-1)^{\frac{1}{2}(p+1)}}=2$, the consecutive values of p being the natural odd primes in order.

NOTES AND NEWS.

At Princeton University Dr. G. D. Birkhoff, assistant professor, and Dr. William Gillespie, preceptor, have been promoted to full professorships in mathematics. S.

Dr. Anna J. Pell has been elected to an instructorship in mathematics at Mount Holyoke College for the year 1911-1912. She is at present conducting courses at Armour Institute, Chicago, during the illness of her husband, Professor Alexander Pell. S.

Professor E. R. Hedrick, of the University of Missouri, has leave of absence for eight months and will spend the time in travel and study abroad. S.

Professor E. B. Van Vleck, who has been on leave of absence from the University of Minnesota since June, 1910, has returned to resume his duties for the second semester. S.

Dr. H. B. Smith has been appointed Instructor of Mathematics at the University of Pennsylvania, for the ensuing term, to fill the vacancy caused by the temporary absence of Professor Evans. C.

The Department of Superintendents of the National Education Association met at Mobile, Alabama, on February 23, 24, 25, 1911. The annual meeting of the Association is to be held in San Francisco early in July. S.